<table>
<thead>
<tr>
<th>TSC Category</th>
<th>Planning and Design</th>
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<tbody>
<tr>
<td>TSC</td>
<td>Relay and Protection Systems Development</td>
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<tr>
<td>TSC Description</td>
<td>Develop technical proposals and schematics of protection systems for new substation projects</td>
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<tr>
<th>TSC Proficiency Description</th>
<th>Level 1</th>
<th>Level 2</th>
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<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
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<td>EPW-EPM-2055-1.1</td>
<td>EPW-EPM-3055-1.1</td>
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<tr>
<td>Prepare schematics and drawings of protection systems and relays</td>
<td>Develop proposals and schematics of protection systems and relays</td>
<td>Review technical proposals and schematics of protection systems and relays for new substations or circuits and prepare complex protection systems proposals for transmission and distribution substations</td>
<td>Formulate procedures and policies to guide the development and review of proposals and schematics of protection systems and relays in accordance with latest industry developments, trends and best practices</td>
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**Knowledge**

- Components of electricity transmission and distribution protection systems
- Characteristics and potential dangers of protection system components
- Concepts of layouts, designs and drawings of substations and circuits
- Concepts of settings, schematics and specifications of protection systems
- Computer-aided drawing techniques
- Operating principles of transmission and distribution feeder protection systems
- Components and operating principles of protection relays
- Concepts of settings, schematics and specifications of protection systems
- Technical proposal and schematic formulation methods
- Components and operating principles of transmission and distribution protection systems
- Components and operating principles of complex protection relays
- Complex protection settings, schematics and specifications
- Rules for control and safe operation of low and high voltage apparatus
- Evaluation techniques of technical proposals and schematics of protection systems for new substations or circuits
- Components and operating principles of transmission and distribution protection systems
- Rules for control and safe operation of low and high voltage
- Settings, schematics and specifications of large-scale protection systems involving new substations and new circuits
- Industry developments, trends and best practices in network protection schemes
- Organisational strategies and directions
- Development of processes, policies and procedures

**Abilities**

- Interpret drawings and specifications of substations and their equipment
- Prepare schematics and drawings of protection systems and relays
- Assist in preparing schematics and drawings of main and backup protection systems
- Assist in preparing technical specifications of main and backup protection systems
- Prepare proposals and schematics of transmission and distribution complex protection systems and relays
- Review and endorse technical proposals and reviews
- Review proposals and schematics of transmission and distribution protection systems for new substations or new circuits

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| SKILLS FRAMEWORK FOR ENERGY AND POWER  
| TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT |

| Utilise computer-aided drawing software | Prepare proposals and schematics of simple protection systems and relays | Schematics of simple protection systems for new substations or circuits based on network operational requirements | Lead the relay and protection systems development team and develop procedures and policies to guide the development  
| Range of Application | Range of application includes, but is not limited to:  
| Current transformer and/or voltage transformer (CT/VT) circuits  
| Trip circuits  
| Protection relays used in substations  
| Distance protection  
| Differential protection  
| Busbar protection,  
| Main and backup protection | Revise protection philosophies, policies and procedures to reflect latest industry developments, trends and best practices |